IN THE CLAIMS

1. (Previously Presented) A method of making an emitter contact for an emitter region of a bipolar transistor, the method comprising:

forming a polysilicon structure over an emitter region position of a semiconductive substrate, the substrate having a surface at the emitter region position;

providing a metal; and

cross-diffusing at least portion of the provided metal and at least a portion of the polysilicon structure to produce a metal emitter contact entirely above the surface of the substrate at the emitter region position.

2. (Original) The method of claim 1 further including forming an emitter region at the emitter region position after forming the polysilicon structure.

3. (Original) The method of claim 2 wherein the polysilicon structure includes a doped layer and forming the emitter region comprises outdiffusing dopant from the doped layer to the emitter region position.

4. (Previously Presented) A method of making an emitter contact for an emitter region of a bipolar transistor, the method comprising:

forming a polysilicon structure over an emitter region position of a semiconductive substrate, the substrate having a surface at the emitter region position, wherein forming the polysilicon structure on an emitter region position comprises:

forming a diffusion barrier layer; and

forming a polysilicon layer on the diffusion barrier layer;

providing a metal in contact with the polysilicon structure; and

cross-diffusing at least a portion of the provided metal and at least a portion of the polysilicon structure to produce a metal emitter contact entirely above the surface of the substrate at the emitter region position.

5. (Previously Presented) A method of making an emitter contact for an emitter region of a bipolar transistor, the method comprising:

forming a polysilicon structure over an emitter region position of a semiconductive substrate, the substrate having a surface at the emitter region position, wherein forming the polysilicon structure on an emitter region position comprises:

forming a diffusion barrier layer, wherein the diffusion barrier layer comprises at least one of the following: a silicon carbide, a silicon oxycarbide, and a titanium nitride; and

forming a polysilicon layer on the diffusion barrier layer;

providing a metal in contact with the polysilicon structure;

cross-diffusing at least a portion of the provided metal and at least a portion of the polysilicon structure to produce a metal emitter contact entirely above the surface of the substrate at the emitter region position.

6. (Original) The method of claim 4, wherein the polysilicon layer includes polysilicon and germanium.

7. (Previously Presented) The method of claim 1 wherein cross-diffusing at least a portion of the provided metal and the polysilicon structure comprises cross-diffusing the provided metal and substantially all of the polysilicon structure.

8. (Canceled)

9. (Canceled)

10. (Previously Presented) The method of claim 1 wherein cross-diffusing at least a portion of the provided metal and the portion of the polysilicon structure comprises:

heating the provided metal and the polysilicon structure.

11. (Original) The method of claim 1 wherein the metal comprises at least one of aluminum, gold, and silver.

12. (Previously Presented) A method of making an emitter contact for a bipolar transistor, the method comprising:

forming a polysilicon structure on an active region of the transistor, the polysilicon structure including:

a diffusion barrier layer on the active region; and

a polysilicon layer on the diffusion barrier layer;

providing a metal; and

cross-diffusing at least a portion of the provided metal and at least a portion of the polysilicon layer to thereby form an emitter contact.

13. (Original) The method of claim 12, wherein the polysilicon layer includes a dopant.

14. (Original) The method of claim 12, wherein the diffusion barrier layer comprises at least one of the following: a silicon carbide, a silicon oxycarbide, and a titanium nitride, and the polysilicon layer includes polysilicon and germanium.

15. (Previously Presented) The method of claim 12 wherein cross-diffusing metal and the polysilicon layer comprises cross-diffusing metal and substantially all of the polysilicon layer.

16. (Previously Presented) The method of claim 12 wherein cross-diffusing metal and at least a portion of the second polysilicon layer, comprises:

depositing metal on the polysilicon layer; and

heating the deposited metal and the polysilicon layer.

17. (Original) The method of claim 12 wherein the metal comprises at least one of aluminum, gold, and silver.

18. (Previously Presented) A method of making an emitter contact for a bipolar transistor, the method comprising:

forming a polysilicon structure on an emitter region position of the transistor, the polysilicon structure including a doped diffusion barrier layer on the emitter region position and a polysilicon layer on the diffusion barrier layer;

depositing metal including at least one of aluminum, gold, and silver on the polysilicon layer; and

heating at least the deposited metal and the polysilicon structure to urge diffusion of the deposited metal into the polysilicon layer, with the doped diffusion barrier layer inhibiting diffusion of the deposited metal into the emitter region position of the transistor.

19. (Original) The method of claim 18, wherein the diffusion barrier layer comprises at least one of the following: a silicon carbide, a silicon oxycarbide, and a titanium nitride.

20. (Previously Presented) A method of making a metal contact for a bipolar transistor, the method comprising:

forming a conductive diffusion barrier over an emitter region position of the transistor;

forming a polysilicon structure on the conductive diffusion barrier;

forming a metal layer on the polysilicon structure; and

cross-diffusing at least a portion of the metal layer and at least a portion of the polysilicon structure to form a metal contact having a lower-most surface overlying the emitter region position of the transistor.

21. (Original) The method of claim 20 further including forming an emitter region in the layer underneath and in contact with the polysilicon structure.

22. (Original) The method of claim 21 wherein the polysilicon structure includes a doped layer contacting a region of the layer and forming the emitter region comprises diffusing dopant from the doped layer into the region.

23. (Previously Presented) A method of making a bipolar transistor having self-aligned base contacts and self-aligned metal emitter contact, the method comprising:

forming first and second polysilicon base contacts on a semiconductive layer, the contacts spaced apart to define an active region in the semiconductive layer;

outdiffusing dopant from the first and second base contacts into the semiconductive layer to form extrinsic base regions aligned with the base contacts;

implanting an intrinsic base region in the active region;

forming a doped diffusion barrier layer on the intrinsic base region;

forming a doped polysilicon layer on the doped diffusion barrier layer;

forming an emitter region self-aligned with the doped diffusion barrier layer by outdiffusing dopant from the doped diffusion barrier layer into the intrinsic base region;

forming a metal layer in contact with the doped polysilicon layer; and

cross-diffusing at least a portion of the metal layer and at least a portion of the polysilicon layer after forming the emitter region, thereby forming a metal emitter contact self-aligned with the emitter region.

24. (Previously Presented) The method of claim 23:

wherein cross-diffusing at least a portion of the metal layer and at least a portion of the polysilicon structure includes cross-diffusing metal and substantially all of the polysilicon layer.

25. (Original) The method of claim 24, wherein the diffusion barrier layer comprises at least one of the following: a silicon carbide, a silicon oxycarbide, and a titanium nitride, and the polysilicon layer includes polysilicon and germanium.

26. (Previously Presented) The method of claim 24 wherein cross-diffusing metal and substantially all of the polysilicon layer comprises:

depositing metal on the polysilicon layer; and

heating at least the deposited metal and the polysilicon layer to a predetermined temperature.

27. (Original) The method of claim 23 wherein the metal comprises at least one of aluminum, gold, and silver.

28. (Previously Presented) A method of reducing emitter resistance of a bipolar transistor, the method comprising:

forming a bipolar transistor structure having a polysilicon emitter contact electrically coupled to an emitter region of the transistor structure, with the polysilicon emitter having an electrical resistance;

forming a metal layer in contact with the polysilicon emitter; and

cross-diffusing at least a portion of the metal layer and at least a portion of the polysilicon emitter contact to reduce the electrical resistance of the contact.

29-30. (Canceled)

31. (Cancelled)

32. (Previously Presented) A method of making a bipolar transistor having self-aligned base contacts and self-aligned metal emitter contact, the method comprising:

forming first and second polysilicon base contacts on a semiconductive layer, the contacts spaced apart to define an active region in the semiconductive layer;

outdiffusing dopant from the first and second base contacts into the semiconductive layer to form extrinsic base regions aligned with the base contacts;

implanting an intrinsic base region in the active region;

forming a doped polysilicon structure on the intrinsic base region, wherein the polysilicon structure includes:

a doped diffusion barrier layer on the intrinsic base region; and

a polysilicon layer on the doped diffusion barrier layer; and

forming an emitter region self-aligned with the doped polysilicon structure by outdiffusing dopant from the doped polysilicon structure into the intrinsic base region;

forming a metal layer in contact with the emitter region; and

cross-diffusing at least a portion of the metal layer and substantially all of the polysilicon layer after forming the emitter region, thereby forming a metal emitter contact self-aligned with the emitter region.

33. (Previously Presented) A method of making a metal emitter contact for an emitter region position of a bipolar transistor, the method comprising:

forming a diffusion barrier layer over the emitter region position of a semiconductive substrate;

forming a polysilicon layer on the diffusion barrier layer and over the emitter region position;

forming a metal layer in contact with the polysilicon layer; and

cross-diffusing at least a portion of the metal layer and at least a portion of the polysilicon layer to produce the metal emitter contact, the metal emitter contact electrically coupled to the emitter region through the diffusion barrier layer.

34. (Previously Presented) A method of making a metal emitter contact for an emitter region position of a bipolar transistor, the method comprising:

forming a diffusion barrier layer over the emitter region position of a semiconductive substrate, wherein the diffusion barrier layer includes a dopant;

forming a polysilicon layer on the diffusion barrier layer and over the emitter region position;

forming a metal layer in contact with the polysilicon layer; and

cross-diffusing at least a portion of the metal layer and at least a portion of the polysilicon layer to produce the metal emitter contact, the metal emitter contact electrically coupled to the emitter region through the diffusion barrier layer; and

outdiffusing at least a portion of the dopant into the emitter region position.

35. (Previously Presented) A method of making an emitter contact for an emitter region position of a bipolar transistor, the method comprising:

forming a polysilicon structure over an emitter region position of a semiconductive substrate, the substrate having a surface at the emitter region position;

forming a metal layer over the polysilicon structure; and

cross-diffusing at least a portion of the metal layer and at least a portion of the polysilicon structure to produce a metal emitter contact have a surface confronting the surface of the substrate.

36. (Previously Presented) The method of claim 35 further including forming an emitter region at the emitter region position after forming the polysilicon structure.

37. (Previously Presented) The method of claim 35 further including forming an emitter region at the emitter region position after forming the polysilicon structure and before substituting metal.

38. (Previously Presented) The method of claim 35 wherein the polysilicon structure includes a doped layer and forming the emitter region comprises outdiffusing dopant from the doped layer to the emitter region position.

39. (Previously Presented) The method of claim 1, wherein cross-diffusing at least a portion of the provided metal with at least a portion of the polysilicon structure comprises diffusing metal from a metal layer that contacts the polysilicon structure into the polysilicon structure and diffusing polysilicon into the metal layer.

40. (Previously Presented) The method of claim 1, wherein cross-diffusing at least a portion of the provided metal with at least a portion of the polysilicon structure displaces polysilicon in the portion of the polysilicon structure.

41. (Canceled)